**OCTOBER, 1922**

# ENTOMOLOGICAL NEWS

Vol. XXXIII No. 8

CHARLES ALFRED BLAKE
1834-1903

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PHILADELPHIA, PA.
THE ACADEMY OF NATURAL SCIENCES,
Logan Square

Entered at the Philadelphia, Pa., Post Office as Second Class Matter.
Acceptance for mailing at the special rate of postage prescribed for in Section 1103,
Act of October 3, 1917, authorized January 15, 1921.

# ENTOMOLOGICAL NEWS

published monthly, excepting August and September, in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

**ANNUAL SUBSCRIPTION, $2.50 IN ADVANCE**
**FOREIGN SUBSCRIPTIONS, $2.70 IN ADVANCE**
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| One issue, 1 in., | $ 1.20, | 2 in., | $ 2.40, | half page, | $ 4.00, | full page,, | $ 8.00 |
| Five issues, " | 5.50, " | | 11.00, " | | 17.50, " | | 35.00 |
| Ten issues " | 11.00, " | | 20.00, " | | 35.00, " | | 70.00 |

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# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

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## A Collecting Adventure Near Home (Coleop.).


By FRANK R. MASON, Philadelphia, Pennsylvania.


Early June, 1921, found Mr. Alan S. Nicolay, of Brooklyn, New York, and myself scouring the subalpine region of the White Mountains, New Hampshire, in search of Coleoptera, especially the rarer forms of Cychrini. However most species of this group *are* rare and require rather careful hunting.

We confined our efforts largely to the higher slopes of Mount Madison, Carter's Dome and up through Tuckerman's Ravine to the summit of Mount Washington (6288 ft.). All these points are accessible from Glen House, New Hampshire, which is the center of the wildest remaining section of the White Mountain region, far enough removed from tin cans and lunch boxes and the blare of auto horns to occasionally see a wild-cat slink along the trail and often raise a covey of grouse in the denser thickets.

*Nomaretus bilobus* Say, probably one of the rarest beetles in eastern North America and frequently confused in collections with the more common *fissicollis* Lec. and *cavicollis* Lec. from the Central States, was taken on Mount Madison at about forty-five hundred feet in heavy timber just below the lichened rocks, and two other specimens at a bit lower elevation in Tuckerman's Ravine under rotted bark. One specimen of the *leonardi* Harr. form of *Scaphinotus viduus* Dej. found its way into our perfumed tin traps in the valley floor, the bait consisting of molasses and assafoetida, a most sickening solution, which I should think any self-respecting *Cychrus* would avoid. A dead mouse added to the brew sometimes makes it even more effective. *Sphaeroderus canadensis* Chd. and *lecontei* Dej. were more abundant companions of the others.

Under the big summit rocks on Mount Washington we took in fair numbers *Carabus chamissonis* Fisch. var. *groenlandicus* Dej.; this is a species from The Labrador. Snow was found at the head-wall of Tuckerman's Ravine and, when marooned on the summit that night, the temperature dropped to twenty degrees; and all this in June east of the Rockies was quite a surprise. The next morning the sprightly *Cicindela longilabris* Say escorted us down the very easy wagon road. We took *Pterostichus (Cryobius) hudsonicus* Lec. and *Patrobus septentrionis* Dej. (a Palaearctic species) at six thousand feet and lower down *Pterostichus (Lyperopherus) punctatissimus* Rand., as well as the commoner *Pterostichus honestus* Say, *luczoti* Dej., *coracinus* Newm., *relictus* Newm., etc., and when within five hundred yards of Glen House a single specimen of *Pogonocherus fasciculatus* Deg. (a Greenland longicorn) and *Xylotrechus annosus* Say dropped into the sweep-net.

Along the banks of the Peabody River (West Branch) I found *Platidius rugicollis* Rand., not common in collections, also many other less interesting Carabidae as *Nebria suturalis* Lec., *Pristodactyla advena* Lec., *Trechus chalybeus* Dej., *Loricera coerulescens* L., *Bembidion nitens* Lec. and *scopulinum* Kby.

*Pselaphidae* and *Scydmaenidae* were very scarce, persistent sifting only secured three species; these families seem to dwin-

dle as one goes north. I think this is also true of the western part of the continent.

On the bare, wind-swept rocks of Carter's Dome we took various good Elaterids: *Lepturoides denticornis* Kby., *Ludius spinosus* Lec., *virens* Schrank, *triundulatus* Rand., etc. This type of collecting is much like picking berries, you scramble over the rocks and gather in the crop, with always those superb glimpses of tumbled mountains below you. But atmospheric conditions must be just right, bright sunshine and not too strong a breeze. Some days we found no insects on the summits.

Carter's Notch near the little lake yielded some interesting things: *Scotodes americanus* Horn, *Phryganophilus collaris* Lec. (a rare Melandryid), *Schizotus cervicalis* Newm. and *Pedilus cyanipennis* Bland., sunning themselves on fallen timber. Some skinned poplar logs attracted *Gaurotes abdominalis* Bland., *Anthophilax attenuatus* Hald. and other longicorns. *Dichelonyx subvittata* Lec., together with numerous Buprestids and Elaterids were beaten from oak, spruce and pine. In vain I searched near the type locality for *Cicindela ancocisconensis* Harr.; I think we were too early. Clerids were few, probably for the same reason.

The above is by no means a complete list of species, only the more striking captures being noted, a large number of other boreal Coleoptera having been taken. In the valley the fauna was typically New England and general run; practically all the rarer species were found between three thousand and fifty-five hundred feet elevation.

This tract of the White Mountains is a most interesting region, a lovely sylvan country of running mountain streams clear and cold, where the Pipes of Pan will whistle to you all day long and with peaks high above timber-line to add a certain grandeur to it all, not often found among our eastern hills. The collecting, to be sure, is not bizarre and exotic like the tropics, neither are you subjected to the excessive discomforts of those hot countries. One great advantage, these mountains are almost in our back gardens; a trip of but fifteen hours by rail brings you to their very gateway. So I say to all entomologists, "why not go!"

## Synonymic Notes on Lepidoptera.

By J. McDUNNOUGH, Entomological Branch, Ottawa.

In *Entomological News*, xxxii, p. 253, Drs. Barnes and Lindsey gave a few synonymic notes based on figures of some of Boisduval and Guenée's types published by Mr. C. Oberthür in Volume XXVII of his *Etudes de Lepidopterologie Comparée*.

Through the kindness of Dr. H. Skinner I have been able to examine a copy of the plates of this work and note a few additional changes in synonymy.

Plate DIII, figs. 4193, 4194, *Chelonia doris* Bdv. According to the original descriptions Fig. 4194 agrees with *doris* and Fig. 4193 with *nerea* Bdv. The species is, however, not *arge* Dru. as at present listed, but *michabo* Grt., and Boisduval's names will take priority. Typical *doris* has the lines and bands on primaries suffused with pink, whilst *nerea* represents the white banded form.

We have in the Canadian National Collection specimens from Calgary, Alberta, and Aweme, Manitoba, that agree well with *nerea*, whilst specimens from Southern British Columbia approach closer to *doris*. *Michabo* Grt., described from Nebraska, falls to *nerea; minea* Sloss., described from New Hampshire, is more intensely colored than *doris* and the name for the present may be held for the Atlantic Coast race. The synonymy will stand:

doris Bdv.
form nerea Bdv.
*michabo* Grt.
*a. minea* Sloss.

Pl. DV, fig. 4217, *Acronycta clarescens* Gn. The species was described from specimens in the Guenée, Boisduval and Doubleday collections, the latter type being in the British Museum. According to the type figured by Mr. Oberthür and to which we believe the name should be restricted, *clarescens* is evidently the same species as *pruni* Harris, but not the species figured by Hampson (Cat. Lep. Phal., Brit. Mus., VIII, 80, Pl. CXXIV, fig. 29) which belongs in the *inclara* group, showing no dark shade line between anal angle and t. p. line.

The synonymy given by Hampson will hold, with the addition of *smithi* Butl.

Plate DVI, fig. 4228, *Macaria contemptata* Gn. This species must certainly be removed from the synonymy of *granitata* Gn. The figure represents a species quite different from the usual conception of *granitata,* but one that is unknown to me in nature.

Plate DVII, figs. 4237, 4238, *Ypsipetes pluviata* Gn. An examination of the excellent figures shows that not only are the two sexes not conspecific, but also that neither of them represents the conception of the species as given in my *Hydriomena* revision (1917, Barnes & McDunnough, *Contributions,* IV, (1), 24). Under the circumstances I propose restricting the name to the male type (Fig. 4238), which is apparently a rather worn specimen of what was listed in the revision as *frigidata* Wlk.; the pale spot near the anal angle, the general trend of the lines and the dark hindwings all indicate this species; an examination of the genitalia should easily verify this reference. With *pluviata* Gn. taking priority over *frigidata* Wlk. the name *divisaria* Wlk. may be used for the *pluviata* of the revision. The female (Fig. 4237) appears to belong to *renunciata* Wlk., although somewhat smaller than usual.

Plate DVII, fig. 4240, *Coremia defensaria* Gn. I do not see how it is possible to consider this figure as correctly representing the type of *defensaria.* Guenée's description was drawn up from a single male and he notes that the pectinations of the antennae are more robust than in *convallaria* Gn.; in Oberthür's figure the antennae show no signs of pectinations, being thread-like, and the specimen figured looks extremely like a female. Furthermore the remainder of the description does not fit the figure at all well, which, as a matter of fact, represents a specimen of *Perizoma polygrammata* Hlst. or one of its close allies. Until further evidence can be produced it would be well to make no change in the present conception of *defensaria;* as pointed out by Mr. Swett, it is not a *form* of *convallaria,* as given in the 1917 Check List, but a good species.

## Additional Data on North Carolina Tabanidae, Bombyliidae and Tachinidae (Diptera).

By C. S. BRIMLEY, Division of Entomology, N. C. Dept. of Agriculture, N. C.

The present paper is supplementary to those previously published in the NEWS as follows: on Tabanidae, vol. xv, pp. 270-275 (1904) and xix, pp. 168-173 (1908); on Bombylüdae, vol. xxxii, pp. 170-172 (1921); on Tachinidae, vol. xxxiii, pp. 20-26 (1922).

### I. TABANIDAE.

CHRYSOPS BISTELLATUS Daecke. Lake Ellis, not uncommon on road between Havelock and the lake, in late May, 1908, F. Sherman and CSB.

CHRYSOPS CUCLUX Whitney. Raleigh, late April, 1912, CSB.

CHRYSOPS DORSOVITTATUS Hine. Lake Ellis, two in late May, 1908, Southern Pines, May, 1908, Manee; White Lake, late May, 1909 and early June, 1915, FS.

CHRYSOPS HINEI Daecke. Boardman, September 21, 1915, R. W. Leiby, Fair Bluff, September 25, 1920, T. B. Mitchell.

CHRYSOPS INDUS O.S. Linville Falls, early June, 1920, one, FS.

CHRYSOPS PUDICUS O.S. The specimens from Havelock (Lake Ellis) formerly referred to *cursim* seem to belong here, while the Raleigh *cursim* seem to be actually that species.

CHRYSOPS SEPARATUS Hine. A male was taken by me at Raleigh, April 20, 1921.

TABANUS CYMATOPHORUS O.S. Southern Pines, A. H. Manee.

TABANUS ENDYMION O.S. White Lake, early June, 1914, FS.

TABANUS SULCIFRONS Macq. Rocky Mount, mid September, 1911, four, Z. P. Metcalf.

TABANUS TENER O.S. White Lake, late May, 1909, one, FS.

(All the preceding are new to our state list except C. separatus).

### II. BOMBYLIIDAE.

(Species new to the state list are marked with a * star).

ANTHRAX ALTERNATA Say. Dillard-Highlands road, July 11, 1921. T. B. Mitchell.

ANTHRAX CEYX Loew. Marion, July 8, 1921, three, TBM.

*ANTHRAX FAUNUS Fab. Raleigh, mid August 1914, C. L. Metcalf; late July 1912, July 22, 1921.

*ANTHRAX NIGRIPENNIS Cole. All the Raleigh specimens previously referred by me to *halcyon* (Ent. News, XXXII, 171) belong to this species as well as five others taken in mid and late June, 1921. *Nigripennis* is not only darker-winged than *halcyon*, but also differs in venation (at least in our North Carolina specimens) as follows,—in *halcyon*

the third posterior cell is bisected on a level with the distal end of the discal cell and the stump which projects into the distal portion of that cell arises from the discal cell, while in *nigripennis* that cell is bisected by a crossvein which is oblique to the discal cell and closes the proximal part of the third posterior cell not far from the wing margin, the stump arises from that crossvein and not from the discal cell. In both *ceyx* and *halcyon* the first antennal joint is red, the second and third black, while in *nigripennis* the first and second are red, the third only black. *Ceyx* and *nigripennis* fly in early or mid summer, *halcyon* in autumn.

ANTHRAX HALCYON Say. Aberdeen October 3, 1921, TBM.

*ANTHRAX DISPAR Coq. Southern Pines, August 6, 1921, TBM.

ANTHRAX HYPOMELAS Macq. Dillard-Highlands road, July 11, 1921, TBM.

*ANTHRAX LATERALIS var. *arenicola* Johnson. Southern Pines, late June, 1909, CSB., Dillard-Highlands road, July 11, 1921, TBM.

BOMBYLIUS SUBVARIUS Johnson. The single specimen from White Lake referred by me to this species (Ent. News, XXXII, 171) appears to be *B. fraudulentus* and not this species, hence *subvarius* is thereby eliminated from the state list.

*BOMBYLIUS FRAUDULENTUS Johnson. Raleigh, late May, CSB, June 14, 16, 1921, on flowers of Ceanothus, also the White Lake specimen mentioned above.

*BOMBYLIUS MEXICANUS Wied. Raleigh, late April to late May, common, Southern Pines, April, 1907, FS; Hendersonville, June, 1907, FS; Blowing Rock, June 25, 1902, FS, Andrews, mid May, 1908, FS. All these formerly referred to *B. varius* under a misapprehension.

BOMBYLIUS VARIUS Fabr. All our previous records (Ent. News, XXXII, 171) belong to *B. mexicanus*, except that from Charlotte, which is of a badly rubbed specimen of *azaleae*. The species, however, still remains on our list as I collected one at Fayetteville, in early June, 1921.

EXOPROSOPA DECORA Loew. Old Fort, late October, 1920, FS.

*GERON SUBAURATUS Loew. One taken at Raleigh, June 18, 1921, CSB. Although I took numerous other Gerons during the summer they were all *senilis*.

*ONCODOCERA LEUCOPROCTA Wied. "North Carolina," Aldrich's Catalogue of North American Diptera, page 239.

SPOGOSTYLUM CEPHUS Fabr. Marion, July 8, 1921, TBM.

TOXOPHORA LEUCOPYGA Wied. Goldsboro, July 26, 1921, TBM.

III. TACHINIDAE.

(Records of my own collecting are without initials).

A. Species not previously recorded.

ALOPHORA AENEOVENTRIS Will. Raleigh, May 17, 1921, TBM.

ALOPHORA near PULVEREA Coq. Raleigh, April 2, 1906.

CELATORIA DIABROTICAE Shimer, Raleigh, August 16, 1921.
DORYPHOROPHAGA DORYPHORAE Riley. Terra Ceia, August 24, 1919, RWL.
EPIGRYMIA POLITA Td. Raleigh, May 17, 1921.
EXORISTA FUTILIS O.S. Raleigh, late April, mid June.
FRONTINA ARCHIPPIVORA Will. Raleigh, mid April, 1920, M. R. Smith.
GAEDIOPSIS FACIALIS Coq. Raleigh, September 8, 13, 21, 1921.
HOUGHIA SETIPENNIS Coq. Raleigh. July 22, 1921.
JURINELLA AMBIGUA Macq. Linville, August 19, 1921, TBM.
LESKIA THECATA Coq. Raleigh, September 8, 13, 21, 1921.
MASICERA MYOIDEA Desv. Raleigh, August 16, 29, October 17, 20, 1921.
OCYPTERA DOSIADES Walker. Raleigh, mid June, mid August and mid September, 1921, thirteen specimens; Goldsboro, July 28, 1921, one, TBM.
OESTROPHASIA SIGNIFERA V. d. W. Raleigh, May 23, 1921, one in window.
PARAPLAGIA SPINOSULA Bigot. Raleigh, April 21, 1921; Fayetteville, early June, 1921.
PHORANTHA CALYPTRATA Coq. Raleigh, May 14, 1921.
PLECTOPS MELISSOPODIS Coq. Raleigh, June 25, October 4, 1921.
PSEUDATRACTOCERA NEOMEXICANA Td. Balsam, mid September, 1908, ZPM.
PYRAUSTOMYIA PENITALIS Coq. Fayetteville, late May, 1920, early June, 1921; Raleigh, June 1, 11, 1921.
SIPHOCLYTIA ROBERTSONI Td. September, 1921, one.
SIPHOPLAGIA SIMILIS Td. November 9, 1920, also the specimens previously attributed to *S. anomala.*
THRYPTOCERA FLAVIPES Coq. Raleigh, June 18, August 16, 1921.

B. Additional Records of some species.

CHAETOGAEDIA CREBRA V. d. W. Raleigh, November 5, 1921.
EUTHERA TENTATRIX Loew. Raleigh, October 17, 1921.
MASIPHYA BRASILIANA BB. Raleigh, late June, 1920.
OCYPTERA ARGENTEA Td. Raleigh, late July, 1912, September 13, 1921.
SIPHONA GENICULATA DeG. Raleigh, July 5, 1921, four.
SIPHOPHYTO FLORIDENSIS Td. (*Epigrymia floridensis*). Raleigh, mid July, mid May, mid August, three; Fayetteville, late May, 1920, one

C. Notes and Corrections to my list in Entomological News, January, 1922.

DINERA FUTILIS Smith. Is a Dexiid.
MYIOPHASIA AENEA Wied. Of the specimens referred by me to this form most of those from Raleigh, and those from Gibson, run to *Enyomma globosa* by Townsend's key, while some of those from Raleigh and the specimens from Elrod, Fayetteville, and Charlotte run to *Phasioclista metallica.* I mention this without prejudice to any of the names quoted.
NEOPHYTO SETOSA Coq. One from Raleigh has the apical cell open and appears to be this, but two others although very similar from Raleigh, August 23, 1921, and Spruce (Sunburst) late May, 1912, have the apical cell long petiolate, and may be *Phytodes hirculus* Coq.
SIPHOPLAGIA ANOMALA Td. All our specimens appear to be *S. similis* Td.

## Catocala ulalume a Distinct Species (Lepid., Noctuidae).

By G. H. FRENCH, Herrin, Illinois.

In his number for September, 1877, of *Lepidoptera Rhopaloceres and Heteroceres,* Mr. Herman Strecker described *Catocala ulalume*, on page 132. We know that Mr. Strecker's descriptions were not of much account as far as using them by some one else for future identification of specimens, and yet a few expressions in this description may serve to help us in the recognition of, and separation of, this species from the specimens of the variable species *C. lacrymosa* where it has been placed for a number of years.

In the description he compares *C. ulalume* with *C. desperata* (now *C. vidua*) in color, and says that the brown shade beyond the t. p. line of *C. desperata* is absent in *C. ulalume.* In all of the forms of *C. lacrymosa* this brown shade is present. Another characteristic of *C. lacrymosa* is that near the posterior margin of the primaries is a prominent white shade inside the t. a. and outside the t. p. lines. This is absent in both *C. dejecta* and *C. ulalume.* The ground color of *C. dejecta* is a little lighter bluish gray than that of *C. ulalume,* and there are other markings that separate them.

Both *C. ulalume* and *C. dejecta* used to be found in the hills of Union County, Illinois, and specimens of each were sent to Mr. Strecker for identification soon after his description of the two species, but my specimens of both have been destroyed. Of late the species, or rather both of them, have been found in the hills of Green County, southwestern Missouri, by my friend, Mr. A. E. Brower. Two specimens of *C. ulalume* were compared with the types in the Strecker collection in the Field Museum, Chicago, by Mr. W. J. Gerhard and pronounced identical.

The species has a clear bluish color over the whole wing except the whitish shade beyond the t. p. line that is without any brown. In the Barnes book, Fig. 6, Plate 2, the whole wing is suffused with brown. I do not know what that figure represents. The subreniform is open in *C. ulalume* but is

closed in the forms of *C. lacrymosa*. The hind wings are black with white fringes, but the black at the ends of the veins of *C. ulalume* and *dejecta* are not as prominent as in *C. lacrymosa*.

During the last season my friend, Mr. Brower, has bred *C. lacrymosa* and *C. ulalume* from the eggs, and he says the larvae are different, but I will let him tell that story. From the above I think that *C. ulalume* is entitled to specific rank.

## Preparatory Stages of Catocala ulalume Str., with Larva of C. lacrymosa for Comparison (Lepid., Noctuidae).

By A. E. Brower, Willard, Missouri.

**Catocala ulalume** Strecker.

*Egg.*—Diameter, .04 inch; height, .03; subspherical in shape, the base flattened, not saucer-shaped, the sides with 25 longitudinal ribs that reach the micropyle, with alternate shorter ones, the space between these with transverse shallower lines, as usual; color gray.

*Larva.*—Stage I.—Head brown; the newly hatched larva yellowish white, becoming grayish white later.

Stage II.—Head light gray, marked with darker stripes; body dark gray, with subdorsal and two lateral darker lines.

Stage III.—Head light gray, marked with brownish gray lines, a heavy black stripe extending upward from the palpi, apices with dark gray brown stripes; body light gray, with broken irregular subdorsal and spiracular lines.

Stage IV.—Head light gray, with longitudinal slaty gray lines, prominent gray brown stripe across apices extending over the front, a heavy black stripe from corner of mouth extending outward and angled upward; body light gray with irregular broken subdorsal and spiracular lines, and with a black shade on the juncture of the fifth and sixth abdominal segments.

Stage V.—Head large, rounded, larger than the next segment, light gray in color with longitudinal slaty gray lines; a prominent gray brown stripe across the apex of each lobe extending over the front, a prominent black stripe extends outward from the mouth and is sharply angled upward, abruptly terminating about half-way up the face; body whitish gray, with irregular broken subdorsal and spiracular lines, the subdorsal present only as quite prominent markings about the tubercles, a faint centrodorsal line present, a shade over the juncture of the fifth and sixth abdominal segments, less prominent on the fourth, fifth and eighth. The tubercles are fairly prominent, enlarged on the eighth abdominal segment, reddish brown in color. Filaments of fringes small, white.

In comparison with the larva of *C. lacrymosa* the larva of this species is much lighter in color, the lines are less continuous and without the dorsal chain of patches. The tubercles are brighter and more prominent on the eighth abdominal segment. The head appears to be comparatively larger with a somewhat different black stripe. In general the larva of *C. ulalume* greatly resembles the larva of *C. insolabilis* but is much lighter in color, while the larva of *C. lacrymosa* is much like the larva of *C. neogama.*

I have reared larvae from the ova laid by four females of *C. ulalume* and find the larvae as well as the moths quite constant. Mr. French has pointed out the differences between the imagines of *C. ulalume* and *C. lacrymosa.* If *C. ulalume* were a variety of *C. lacrymosa,* intergrades would be found. I have taken intergrades to all varieties of *C. lacrymosa* but none connecting *C. lacrymosa* with *C. ulalume.* The flight and habits of *C. ulalume* and *C. lacrymosa* in the woods are quite different. If *C. ulalume* were a variety of *C. lacrymosa* it would be found throughout the range of the latter, but such does not seem to be the case, as *C. ulalume* seems to be found only in the Southern and border United States. It is reported as scarce or rare at St. Louis. Mr. E. A. Dodge kindly allowed me to examine a single worn specimen from Louisiana, Missouri. Mr. E. J. Erb tells me that some years ago he collected several specimens of *C. ulalume* in Western Virginia. Messrs. Erb and Doll compared specimens that I collected here near Willard, Greene County, Missouri, with a cotype of *C. ulalume* in the Brooklyn Museum. Mr. Doll also kindly sent a specimen to Chicago where Mr. Gerhard compared it with Strecker's types of *C. ulalume* in the Field Museum.

**Catocala lacrymosa** Guen.

*Egg.*—This has been described by Barnes and McDonnough in a recent Bulletin of the American Museum of Natural History.

*Larva.* Stage I.—Head blackish brown; body grayish white.

Stage II.—Head brownish black; body light grayish white; light dorsal stripe, laterally reddish brown with two or three faint lateral lines.

Stage III.—Head smoky black apically, face grayish; body dull black with a lighter geminate dorsal and three lateral lines.

Stage IV.—Head dark gray with longitudinal black stripes, heavy black stripe crossing the apex of each lobe, continued by a light stripe to corner of the mouth; body dark gray, a geminate dorsal stripe and three lighter lateral lines.

Stage V.—Head gray, heavily striped with black, a little paler apically. Body gray, with subdorsal and spiracular lines of small black spots; two faint centrodorsal and three darker lateral lines.

Stage VI.—Head light gray, longitudinally lined with dark gray brown stripes, prominent darker brownish stripe on the apex of each lobe extending just over the front; a heavy black stripe extending outward from the jaws, after a short distance apparently merging into the lines of the face; body gray with centrodorsal, subdorsal and two lateral darker lines, the subdorsal being most prominent; dorsum with pale oval or diamond-shaped patches; the posterior portion of the fifth and the anterior of the sixth abdominal segments darker. Fringes pinkish white.

The larvae vary somewhat in shade of color but on the whole are quite constant. A single larva from ova laid by variety *paulina* produced var. *paulina*. The larva was quite similar to the larvae of the normal *lacrymosa*.

The food plant of both *C. ulalume* and *C. lacrymosa* is hickory.

## Biological Notes on Elateridae and Melasidae (Col..)

By H. B. Kirk, Bureau of Plant Industry, Department of Agriculture, Harrisburg, Pennsylvania.

The following miscellaneous biological notes on insects of the families *Elateridae* and *Melasidae* have been assembled from field observations, rearings and collections by the author over a number of years, and from notes and specimens in the collection of the Bureau of Plant Industry by others, to whom due credit is given in the text.

Little is known of the habits of the adults of these two families, although they may be collected on foliage, flowers, trees and on the ground, sometimes beneath stones.

Larvae of some of the species are predaceous. This is particularly true of the species of *Adelocera, Chalcolepidius, Alaus* and *Hemirhipus,* which are decidedly beneficial. Certain species of other genera attack living plant tissue, roots, tubers, etc., and are destructive. Those attacking dead or decaying wood

tissue are of no special economic importance. Larvae of the predaceous forms, although confined to either deciduous trees or conifers in nature, will in captivity feed on any woodboring larvae, and will attain at maturity their natural characteristics and markings.

Many species transform in July and August, and remain in their pupal cells until April or May of the following year. During this time adults with the cast larval skins may be found together, thus furnishing a means of connecting the adults with the larvae. Adults also hibernate beneath bark, in crevices and in abandoned cells of various insects, and are sometimes attracted to light.

While the family *Elateridae* has not been considered as containing any particularly beneficial species, a more thorough study of the younger immature larval stages will no doubt reveal as many equally important predaceous species as those of the family *Cleridae*.

ELATERIDAE.

ADELOCERA IMPRESSICOLLIS Say. Harrisburg, Pennsylvania, VII-15; Rockville, Pennsylvania, XII-12. Rare. Hibernating in decayed cavity in living tree.

A. RORULENTA Lec. El Paso County, Colorado, VI-14, VII-12. A. B. Champlain.

A. BREVICORNIS Lec. State College, Pennsylvania, V-25; Charter Oak, Pennsylvania, V-21; J. N. Knull. Wales, Maine, VI-23; C. A. Frost. Rare.

A. OBTECTA Say. Pennsylvania, VI, VII. Franklin, New Hampshire, IX-18, larva and adult found in gallery of woodborer in apple twig. F. C. Craighead.

A. PROFUSA Cand. Cornwall, Connecticut, VII-15, K. F. Chamberlain; Cranebrook, British Columbia, VII-8, C. B. Garrett; Oregon, VIII-11, adults taken in Yellow Pine, W. D. Edmonston.

A. MARMORATA Fab. Rockville, III-3; Hummelstown, IV-29, Kirk and Knull; and Harrisburg, April, June, July; all in Pennsylvania. Larvae of this species found feeding on *Bostrychid* larvae (*Trichodesma gibbosa*) in Gum tree (*Nyssa sylvatica*).

A. DISCOIDEA Web. All localities in Pennsylvania. Common beneath bark of dead Pine.

A. AVITA Say. Hummelstown, III-29, VII-7, Kirk and Knull, and State College, V, both Pennsylvania. A number of adults reared from larvae collected beneath bark of dying and dead hickory trees. These trees were heavily infested with woodboring larvae which were the

hosts of *A. avita*. Have taken a number of adults on these trees at night during June and July.

A. AURORATA Say. State College, Pennsylvania, I-9, from beneath the bark of dead Pitch Pine (*Pinus rigida*), J. N. Knull; Pittsburgh, Pennsylvania, June.

LACON ILLIMIS Horn. Common at Tucson, Arizona. J. H. Shive.

ALAUS LUSCIOSUS Hope. Arizona. Larva reared by feeding it with various woodboring larvae.

A. ZUNIANUS Casey. Adults, larvae and pupae cut from Cerambycid galleries in fallen sycamore tree. East Catalina Mountains, Arizona, June 20, M. Christman.

A. OCULATUS Lec. One of our most common species. Adults and larvae may be found in decaying logs and stumps infested by various woodborers upon which they are predaceous. Very small larvae of this species were observed feeding upon the larvae of *Agrilus bilineatus* in chestnut, also a more mature larva of *A. oculatus* found feeding on larvae of *Buprestis rufipes* in *Liriodendron* stump, and also on larvae of *Chalcophorella campestris* in dead beech (*Fagus americana*) trunk. Have found larvae, about one-half grown, emerging from exit holes of a Cerambycid and *Tremex sp.* in hickory trees, where they crawl about on the trunk and re-enter other burrows in search of woodboring larvae. This species occurs only upon deciduous trees according to our notes.

A. MYOPS Fab. Occurs only in pine. Adults and larvae taken around Harrisburg, Pa., in pine trees and stumps infested with woodboring larvae. At Falls Church, Virginia, have taken hundreds of adults and larvae in yellow pine stumps infested with *Asemum moestum*.

A. MELANOPS Lec. Adults and larvae found commonly in stumps infested with *Chalcophora angulicollis*. Larvae predaceous on various woodboring larvae in dead coniferous trees. Oregon, VIII-8, adults, pupae and larvae in galleries in dead Douglas fir, W. D. Edmonston; El Paso County, Colorado, II-20, A. B. Champlain.

CHALCOLEPIDIUS VIRIDIPILIS Say. Rockville, Pennsylvania, VIII-8, collected at sour sap on oak tree in the evening, Daecke and Kirk; Baltimore, Maryland, July 30, V. A. E. Daecke.

C. SMARAGDINUS Lec. Reared from larvae taken from woodborer gallery in dead wood. Tucson, Arizona, VII-14, J. W. Shive; VIII-6, G. Hofer; Sabino Canyon, Arizona, VII-5, W. D. Edmonston.

C. BEHRENSI Cand. Tucson, Arizona, VII-31, J. W. Shive.

ATHOUS CUCULLATUS Say. Larva collected in dead log where it was feeding on woodboring larva. Adult reared.

LUDIUS HIEROGLYPHICUS Say. Adults collected feeding on small insects on foliage, Knull and Champlain.

HEMICREPIDIUS MEMNONIUS Hbst. Rockville, Pennsylvania, VII-24, under stones.

H. BILOBATUS Say. Harrisburg, Pa., VIII-27, taken on hickory trees at night.

PARALLELOSTETHUS ATTENUATUS Say. Common in rotten logs, feeding on decaying moist wood tissue. Common in vicinity of Harrisburg, Pa., July and August.

Genus ELATER. Larvae of this genus feed on decaying wood tissue. Adults frequent flowers.

ELATER VITIOSUS Lec. Adults and larvae with *Elater sayi* Lec. in decayed hole in living *Celtis occidentalis*, November 12. It is likely that these two forms may be the same species. Kirk and Champlain.

MEGAPENTHES LIMBALIS Hbst. Male of this species taken *in coitu* with black female that answers the description of *M. granulosus*. Falls Church, Virginia, VII-16, F. C. Craighead.

Genus MELANOTUS. Adults of local species hibernate in numbers in old logs beneath bark and in old galleries of woodboring insects, many being found in a single gallery.

PITYOBIUS ANGUINUS Lec. Grand Lake, Presque Isle County, Michigan, VII-2, R. J. Sim; Endeavor, Pennsylvania, VII-30, adult taken on fresh cut white pine log by J. N. Knull.

Genus LIMONIUS. Adults taken around Harrisburg, Pa., fly early in the spring and are found commonly on flowers.

MELASIDAE.

MELASIS PECTINICORNIS Melsh. Reared from dead birch (*Betula lenta*) and beech (*Fagus americana*), J. N. Knull and A. B. Champlain.

ISORHIPIS RUFICORNIS Say. Reared from dead chestnut, black birch, beech, linden and maple.

DELTOMETOPUS AMOENICORNIS Say. North East, Pennsylvania, VII-22, J. N. Knull; Tyrone, VII-26, J. G. Sanders; Jeanette, Klages; Harrisburg, VI-29, A. B. Champlain; and Landisburg, VI-30; all in Pennsylvania. Falls Church, Virginia, VI-24.

DROMAEOLUS CYLINDRICOLLIS Say. Hummelstown, reared from dead *Platanus occidentalis*, J. N. Knull; Ohio Pyle, VII-20, T. L. Guyton; Jeanette, VII, Klages; Clarks Valley, Dauphin County; all in Pennsylvania. Reared from dead standing Hemlock (*Tsuga canadensis*), A. B. Champlain.

D. STRIATUS Lec. Falls Church, Virginia, VII-31; Hummelstown, Pennsylvania, VII-17. Reared from dead chestnut stick.

FORNAX BADIUS Melsh. Harrisburg, Pa. Larva very plentiful in dead, decaying hickory. Adults on hickory trees at night, very active, crawling about and mating.

F. ORCHESIDES Newn. Harrisburg and Inglenook, Pennsylvania, larvae from decaying logs of willow and *Betula nigra* in swamps. The adults of this and other species in the genus are active only at night, and may be found mating, ovipositing and running over dead, decaying trees or logs at this time. During the daytime they crawl into cracks and crevices, where they remain concealed and inactive. The eggs of *F. orchesides* are placed in the cracks and crevices of decaying trees, stumps or logs, the wood of which is usually very soft and contains

considerable moisture. The larvae insinuate their way through the soft wood tissue, the gallery apparently closing up after their passage, and when ready for pupation they work their way to the sapwood, where cells are constructed. The cell is formed by the actions of the larva, and by an accumulation of soft particles rubbed loose. The pupal duration is about two weeks. The adults emerge during June, and vary greatly in size. The spring or clicking operation is developed in this species to some extent. They are able to spring slightly and click when held in the hand by the abdomen. Observation by Champlain, Knull and Kirk.

MICORRHAGUS HUMERALIS Say. New Cumberland, VI-28, Kirk and Champlain.

NEMATODES ATROPUS Say. Harrisburg, Pa., I-28, VII-9, and reared IV-14 from dead hickory stumps. Adults taken at night on dead hickory trees. Kirk and Champlain.

N. PENETRANS Lec. Harrisburg, Pa., VII-4, Kirk and Champlain.

SCHIZOPHILUS SUBRUFUS Rand. Very rare. Taken at night on hickory tree at Harrisburg, Kirk and Champlain (this specimen in collection of U. S. National Museum). East Falls Church, Virginia, III-6. Knull.

### Change of Address.

Dr. Charles P. Alexander has removed from Urbana, Illinois, to Fernald Hall, Mass. Agricultural College, Amherst, Massachusetts.

### Foundation of a Brazilian Entomological Society.

Professor Benedicto Raymundo has written to The American Entomological Society, announcing the foundation, on February 2, 1922, of the Sociedade Entomologica do Brasil, of which he is President. The Society is located at 15 Rua 1o de Março, Rio de Janeiro. We wish it prosperity and a long life.

### Cuvier's Magnifying Glass.

At the meeting of the Entomological Society of France, January 11, 1922, Dr. E. Gobert presented to the Society the magnifying glass (loupe) belonging to Cuvier and gave its origin in the following terms: This glass belonged to Cuvier, died in 1832. Dying, he left it to Audouin, who died in 1841. Audouin confided it to Leon Dufour, celebrated entomologist of St. Sever (Landes). This latter dying, left it to E. Perris, his favorite pupil. E. Perris, in his turn, confided it to me as his pupil and friend. If the Society accepts it, I shall be glad to offer it as a souvenir and in the name of the three entomologists of The Landes.

This glass will be preserved as a precious relic in the archives of the Society. (Bull. Soc. Ent. France, 1922, no. 1, p. 6).

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., OCTOBER, 1922.

### The Need of Greater Precision in Taxonomic Literature.

It is no unusual experience, in reading taxonomic keys, descriptions of species and of genera and similar gems of literature, to meet with expressions intended to be diagnostic but so vague and indefinite as to give no true idea of the part described. Adjectives like "large," "small," "broader," "narrower," are frequently employed without any data being given to indicate the size intended. It does require some additional time and labor on the part of an author to specify how many millimeters these descriptive terms mean, or to state the dimensions of the structure concerned in terms of the length or width of some nearby part, or of the distance between some adjoining organs. Of course it does. But no one in these days has any right to work in taxonomy, or in any other branch of science, unless he is willing and ready to express precisely what the differences between objects compared really are. It is a reproach to us that so much of taxonomic literature is in so hazy a condition.

When one reads in a recent, otherwise valuable manual, on one of the largest orders of North American insects, the alternative rubrics of a key as "Marginal vein short" and "Marginal vein long" without further elucidation, he may, with righteous indignation, exclaim justly, "*How* long, O Lord, *how* long?"

### Additions to the Coleoptera in The Academy of Natural Sciences of Philadelphia.

Three hundred and seven specimens of Coleoptera have been added to the collections from The Hebard-Academy Expedition of 1921. They include such interesting species as *Cicindela longilabris* Say, var. *oslari* Leng; also var. *montana* Lec. (from the summits of the Sandia Mts., New Mexico, 10500-11000 ft.), *Pasimachus obsoletus* Lec., *Platynus texana* Lec., *Chlaenius chaudoiri* Horn, *Helluomorpha texana* Lec., *Agrilus mercurius* Wickh., *Lema texana* Crotch, and *Gnathospasta mimetica* Horn. This is quite a remarkable showing in view of the fact that the collecting was primarily for Orthoptera and during the latter part of the summer when Coleoptera are not so abundant.—FRANK R. MASON.

# Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

## Mr. E. A. Schwarz, Honorary Ph.D.

The University of Maryland, at its commencement exercises on June 10, conferred the honorary degree of Doctor of Philosophy upon Eugene Amandus Schwarz, honorary custodian of Coleoptera in the U. S. National Museum. Mr. Schwarz began work as a beetle specialist for the Division of Entomology under the Commissioner of Agriculture in 1878. His forty-four years of official scientific activity to the present have been continuously devoted to the building up of a great collection and to the assistance of other workers, both taxonomic and economic. As dean of entomologists in Washington and senior coleopterist in active service in North America, permanent president of the Entomological Society of Washington (of which he never misses a meeting), and honorary fellow of the Entomological Society of America, Mr. Schwarz is held in high and universal esteem by the entomological fraternity of the country, who would unanimously second his nomination to the honor now bestowed.—J. M. ALDRICH, U. S. National Museum, Washington, D. C.

## The University of Michigan-Williamson Expedition to Brazil.

Our previous notice (this volume, page 216) of this expedition left it at Porto Velho, Amazonas, Brazil, where it remained until May 30, 1922. On April 30 it was noted of the Odonata: "Both species and individuals seem less numerous than when we were here before [*i. e.*, Jan. 21—March 5, 1922]. Certain species are no longer seen, but no new ones appear to have taken their place;" on the other hand, "some things like *Lais*, *Chalcopteryx*, etc., are much more common now." [May 9]. Considerable collecting was done on the city water supply creek, at this time 12—15 feet wide and 2—5 feet deep. In the last week of April it rained "every day and sometimes practically all day. We managed to put up one box of bugs, however." Nevertheless the second of May "was the record catch for the trip, 269 specimens to put up last night."* "Had a lively battle with a bunch of pestiferous little ants to-night (May 3). First discovered them in the collecting kit making way with the day's catch; then found they were in the drier getting after yesterday's stuff."

On May 9 it was noted: "Rainfall is now much less—larger creeks are wadable—but there are too many *cloudy* days." On May 10 Mr. J. H. Williamson had a return of the malarial fever. On May 12 and 14 Mr. Strohm collected at San Antonio, Matto Grosso, Brazil, as single day trips from Porto Velho.

On May 30 the Expedition left Porto Velho on a steamer of the

*But *cf.* Manáos, June 17, "Last night we papered 280 dragonflies."

Amazon River Steam Navigation Co. for Manáos; proceeding down the Madeira River, many stops were made, at some of which (Humayta, Manicoré, Borbá) a little collecting was done. On the Madeira below Borbá and on the Amazon, which was entered on June 3, the "waters overflowed banks, cacao groves, banana fields, etc. Native huts half submerged and cattle kept on rafts."

One June 4 Manáos was reached. "Rio Negro is now [at] highest stage ever recorded, being 2½ inches higher than in 1909, the former high water mark. Back water appears in the streets in places and the river is still rising." On June 21 Mr. Williamson wrote: "Rio Negro stays at same high level. Frequent rains keep the swamps and creeks in the hills well filled—much better collecting than when rains cease and they go down a foot or two." During this month collecting was done at Manáos itself and between the city and Flores, to which a street car runs. "Real original growth forest was seen for first time to-day [June 18]. Near the road—except where under present cultivation—was the usual second growth, so common around Manáos, but beyond this, the original forest began in lines plainly marked where clearing had ceased. [This was about 7 miles beyond Flores.] In the bottom or swamp lands between the hills there probably has been little or no clearing and no big trees ever grew." On June 17 the total catch of dragonflies was estimated at 7697 specimens and 157 species.

In the beginning of July a "friage" or cold wave, temperature 74° F., was experienced, lasting seven days. On July 2, taking steamship, the expedition proceeded from Manáos up the Rio Negro, which is split into many channels and full of long, wooded islands, the latter, like the river banks, being completely flooded, only the tops of trees visible. On July 6 Santa Isabel was reached without having seen any favorable collecting grounds on the way. At this place, 423 miles from Manáos, indications of a different Odonate fauna were obtained. The return to Manáos began July 8 and on July 11 "many teneral *Diastatops* and four other species of teneral Libellulines were caught by ourselves and fellow passengers," while "large numbers of *Tholymis* came out from shore at sunset, but only caught two as they flew over the boat." Manáos was reached near midnight July 12.

"It is indeed fortunate that we made Porto Velho our chief objective on the trip instead of any of the so-called towns along the Negro. There is nothing worthy the name of village above Manáos. No place have we seen collecting ground for one real day's work, let alone a monthly stop which would be necessary here. Haven't seen a creek all the way up; there may be some but the flooded country has them well concealed. I imagine one would have to travel several hundred miles above Santa Isabel by launch and canoe before reaching good collecting spots and then he would practically have to camp out to work them" (July 11, 1922).

From July 13 to 22 some further collecting was done in the vicinity

of Manáos, bringing the estimated total of specimens and species of Odonata up to 8315 and 162 respectively. There was much cloudy weather and frequent showers. On July 21 "we collected Agrionines in Mr. Russell's house. They were quite numerous flying about, nosing along walls, furniture, etc., and resting on everything in sight from picture cords to the centre of a bed. Though we have caught some of this species in the house heretofore, they were never so numerous as to-day. Some were netted, many were caught by hand."

On July 22 the expedition took steamer from Manáos for Pará. The Rio Negro had fallen only 1½ feet since its new high water mark and the Amazon was still flooding the country to Pará, which was reached on July 29.

Expectations were that the Expedition would leave Manáos about August 1 for Para, leave Para about September 3 for Rio, arriving there September 17. (From Mr. Jesse H. Williamson's "log" and letters).

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### The Stridulation of a North American Noctuid, Heliocheilus paradoxus Grote (Lep.).

On the night of August 16th, 1921, while at Amarillo, Texas, an effort was made to secure species of Tettigoniidae by listening for their stridulation and then locating the singers with the aid of a hand flash-lamp. A wide grassy plain was visited, but it was soon evident that search would be unproductive. Only a few specimens had been heard and these at widely separated spots.

While standing in the knee-high grasses all was silent, when suddenly a faint stridulation became audible. Again and again this sound was approached, but nothing could be located. Finally, when undoubtedly close to a singer, a small buffy moth was seen to be hovering in the shaft of our light, just above the weeds and grasses, holding itself over the same spot by flying against the brisk breeze that was blowing. Suddenly it flew away and the sound ceased. The singer was in fact a moth and not one of the smaller katydids, as had been supposed.

After this, several specimens were easily secured by following up the sound they produced, all acting just as the first individual had done. The stridulation was like "the ticking of a loud watch, but much faster and easily audible to good ears at a distance of twenty feet." When alarmed a singer would fly away noiselessly and at great speed.

The species has been identified by Dr. Henry Skinner as *Heliocheilus paradoxus* Grote.[1] Stridulating organs for the Agaristidae and Noctuidae have been discussed by Dr. Jordan in 1921,[2] but we know of nothing in the literature bearing on the stridulation of the present insect or other North American Noctuids. The species is buffy and not strikingly marked. Toward the costal margin of the fore-wings, the highly specialized stridulating area is found.—Morgan Hebard.

[1] Described from Colorado, Proc. Ent. Soc. Phila., IV, p. 329, pl. 2, figs. 3 (♂), 4 (♀), 5 (♀, reverse), (1865).
[2] Proc. Ent. Soc. Lond., V, p. xxxiii.

**Mulford Biological Exploration of the Amazon Basin News Bulletin No. 9.**

The following letter from Dr. W. deC. Ravenel, Administrative Assistant to the Secretary in charge of the U. S. National Museum, was recently received by Mr. Milton Campbell, President of the H. K. Mulford Company:

"I now take pleasure in advising you that a large amount of additional material collected by Dr. William M. Mann, while a member of your Exploration Expedition, has been turned over to the collections, comprising insects, mammals, shells, crustaceans and textiles. All of the material is recorded as a gift in the name of the Mulford Biological Exploration of the Amazon Basin, and I would repeat my assurances of our appreciation of the generous interest which has been manifested in the national collections."

In reply to the communications from Dr. Ravenel, Mr. Campbell, President of the H. K. Mulford Company, thanked him for the generous expressions of appreciation and said, "It is a pleasure indeed to present these collections to the Smithsonian Institution in view of the splendid work the Institution is doing and its importance to the country."—R. H. HUTCHISON, *Secretary*, Philadelphia, Pa.

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**The Exchange of Scientific Literature with Russia.**

Apropos of the note on this subject published in the NEWS for June of this year, page 186, we reprint the following from *Science* for July 14, 1922, page 45:

"The officers of the Russian Entomo-Phytopathological Congress sent a request some months ago to American scientific societies and investigators to send to Russia literature on entomological and phytopathological matters.

"In connection with this request the Russians promised to send Russian scientific literature in exchange. Certain difficulties, however, have been found to exist, principal among which is a regulation by the Soviet government, made about two months ago, which prohibits the sending out of literature from Russia without a special permit. This permit seems very difficult to get. The Russian scientific men, therefore, who have received American scientific literature in response to their request, feel much embarrassed by their inability to respond by sending Russian literature here, and I have promised to make known, in this way, the facts which have prevented their promised sending of Russian literature to those Americans who have kindly sent scientific papers to them.—VERNON KELLOGG."

In this connection we may call attention also to the arrangements which have been made for sending scientific works to Russia, described at length in *Science* for June 22, 1922, pages 667-668.

# Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**The titles occurring in the Entomological News are not listed.**

**4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **6**—Journal of the New York Entomological Society. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **13**—Journal of Entomology and Zoology, Claremont, Cal. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Entomologique de France, Paris. **21**—The Entomologist's Record, London. **22**—Bulletin of Entomological Research, London. **29**—Annual Report of the Entomological Society of Ontario, Toronto, Canada. **34**—Bulletin de la Societe Entomologique de Belgique, Brussels. **46**—Contributions to the Natural History of the Lepidoptera of North America. Ed. by Wm. Barnes. **48**—Wiener Entomologische Zeitung. **49**—Entomologische Mitteilungen, Berlin-Dahlem. **50**—Proceedings of the United States National Museum. **64**—Parasitology, London. **68**—Science, Garrison-on-the-Hudson, N. Y. **76**—Nature, London. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **86**—The Quarterly Journal of Microscopical Science, London. **89**—Zoologische Jahrbucher, Jena. **90**—The American Naturalist, Lancaster, Pa. **91**—The Scientific Monthly, Lancaster, Pa. **92**—Archives de Zoologie Experimentale et Generale, Paris. **98**—Annals of Tropical Medicine and Parasitology, Liverpool. **99**—Bulletin du Museum National d'Histoire Naturelle, Paris. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **106**—Anales de la Sociedad Cientifica Argentina, Buenos Aires. **109**—Annales Historico-Naturales Musei Nationalis Hungarici, Budapest. **110**—Naturwissenschaftliche Wochenschrift, Jena. **111**—Archiv fur Naturgeschichte, Berlin. **118**—Die Naturwissenschaften, Berlin. **119**—Proceedings of the National Academy of Sciences of the U. S. A., Washington, D. C. **124**—Bulletin de la Societe Entomologique d'Egypte, Cairo. **127**—Archiv fur Entwicklungsmechanik der Organismen, Berlin. **128**—Zeitschrift fur Induktive Abstammungs- und Vererbungslehre, Leipzig. **141**—Internationale Entomologische Zeitschrift, Guben, Germany. **142**—Notulae Entomologicae, Helsingfors, Finland.

**GENERAL. Criddle, N.**—The entomological record, 1920. **29**, li, 72-90. **Felt, E. P.**—The possibility of exterminating insects. **91**,

xv, 35-41. **Hayes, W. P.**—Method of procedure in insect life history investigations. **4,** liv, 73-7. **Hoffmann, A.**—Entomologen-addressbuch. Annuaire des entomologistes. (Wien, 1921, 434 pp., Verlag Adolf Hoffmann.) **Hoffmann, F.**—Deutsche insektennamen in Brasilien. **124,** ii, 65-6. **Horn, W.**—Et meminisse et vaticinari liceat. Ueber oxenstjerna und entomologische museologie. **49,** xi, 42-3. **Howard, L. O.**—A side line in the importation of insect parasites of injurious insects from one country to another. **119,** viii, 133-39. **Lochhead, W.**—Inter-relations in nature. **29,** li, 53-60. **Nuttall, G. H. F.**—The Molteno institute for research in parasitology, University of Cambridge, with an account of how it came to be founded. **64,** xiv, 97-126. **Rau, P.**—Ecological and behavior notes on Missouri insects. (Trans. Ac. Sc., St. Louis, xxiv, No. 7.) **Rowland-Brown, H.**—Obituary. **9,** 1922, 121-3. **Williamson, E. B.**—Keys in systematic work. **68,** lv, 703.

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und ihrer larven. **111,** 1922, A, 1, 1-87. **Hovasse, R.**—Differences de proprietes histochimiques entre l'heterochromosome et les autres chromosomes de Gryllus domesticus. **77,** lxxxvii, 316. **Hyde, R. R.**—A high fecundity record for Drosophila melanogaster. (Proc. Indiana Ac. Sc., 1921, 259-60.) **Ives, H. E.**—The fire-fly as an illuminant. (Jour. Frankl. Inst., Phila., cxciv, 213-30.) **Lancefield & Metz**—The sex-linked group of mutant characters in Drosophila willistoni, **90,** lvi, 211-41. **Macfie, J. W. S.**—On the genital armature of the female mosquito. **98,** xvi, 157-88. **Martini, E.**—Ueber den bau der ausseren mannlichen geschlechtsorgane bei den stechmucken. **111,** 1922, A. 1, 134-42. **Morgan, L. V.**—Non-criss-cross inheritance in Drosophila melanogaster. **100,** xlii, 267-74. **Mueller, A.**—Ueber den bau des penis der tachinarier und seinen wert fur die aufstellung des stammbaumes und die artdiagnose. **111,** 1922, A, 2, 45-166. **Muller, M.**—Rhyphus und Mycetobia mit besonderer berucksichtigung des larvalen darmes. **111,** 1922, A, 2, 1-44. **Mutschler, O.**—Der farbensinn der biene. **110,** xxi, 349-50. **Pawlowsky, E.**—On the anatomy of Phymateus hildebrandti (Orthoptera, Phymateidae) in connection with the peculiarities of its dermal secretion. (Sc. Res. Zool. Exped. Br. E. Africa & Uganda, by Dogiel & Sokolow, Petrograd, i, No. 3.) **Payne & Denny**—A gynandromorph in Drosophila melanogaster. **90,** lvi, 383-4. **Przibram, H.**—Verpuppung kopfloser raupen von tagfaltern. **127,** l, 203-8. **Snodgrass, R. E.**—Mandible substitutes in the Dolichopodidae. **10,** xxiv, 148-52. **Stumper, R.**—L'influence de la temperature sur l'activite des fourmis. **77,** lxxxvii, 9-10. **Thienemann & Zavrel**—Die metamorphose der Tanypinen. (Arc. f. Hydrobiol. u. Plankt., Stuttgart, Suppl. Bd., ii, 566-654.) **Thomson, A. L.**—Notes on the regeneration of the fore-limb in various genera of Mantidae. **127,** l, 192-202. **Titschack, E.**—Beitrage zu einer monographie der kleidermotte, Tineola biselliella. (Zeit. f. Tech. Biol., Leipzig, x, 1-168.) **Wheeler, W. M.**—Social life among the insects. **91,** xv, 68-88. **Whiting, P. W.**—Heredity in the honey-bee. (Jour. of Heredity, Washington, D. C., xiii, 3-7.) **Zeleny, C.**—The effect of selection for eye facet number in the white bar-eye race of Drosophila melanogaster. (Genetics, vii, 1-115.)

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**ORTHOPTERA. Davis, W. T.**—Notes on katydids. **6,** xxx, 73-4. **Griffini, A.**—Sopra due Gryllacris del Museo di Budapest. **109,** xii (1914), 249-60.

**Cabrera, J.**—Descripcion de dos nuevas especies Cubanas de orthopteros del genero Eurycotis. (Mem. Soc. Cubana Hist. Nat., "F. Poey," iv, 94-5.)

**HEMIPTERA. Funkhouser, W. D.**—New records and species of South American Membracidae. **6,** xxx, 1-35. **Gowanlock, J. N.**—The periodical cicada. **68,** lvi, 144. **Hussey, R. F.**—A bibliographical notice on the Reduviid genus Triatoma. **5,** xxix, 109-23.

**Bergroth, E.**—The American species of Ploeariola. **142,** ii, 49-51 (cont.). **Davis, W. T.**—An annotated list of the cicadas of Virginia with description of a new species. **6,** xxx, 36-52. **Penny, D. D.**—A catalogue of the California Aleyrodidae and the descriptions of four new species. **13,** xiv, 21-36.

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ceriden. **89,** xlvi, Abt. f. Syst., 61-120. **Brethes, J.**—(See under Hymenoptera). **Cockerell, T. D. A.**—The dipterous family Blephariceridae. **9,** 1922, 135. **Dyar, H. G.**—The mosquitoes of the United States. **50,** lxii, Art. 1. **Edwards, F. W.**—Mosquito Notes. **22,** xiii, 75-102. **Evans, A. M.**—Notes on the Culicidae in Venezuela, with descriptions of new species. **98,** xvi, 213-22. **Ferris & Cole**—A contribution to the knowledge of the Hippoboscidae. **64,** xiv, 178-205. **Kertesz, K.**—Vorarbeiten zu einer monographie der Notacanthen. **109,** xii (1914), 449-557. **Leathers, A. L.**—Ecological study of aquatic midges and some related insects with special reference to feeding habits. (Bul. Bur. Fish., Washington, xxxvii, Doc. No. 915.) **Malloch, J. R.**—An unusual taxonomic character in Syrphidae. **19,** xvii, 42. **Marshall, J. F.**—The destruction of mosquito larvae in salt or brackish water. **68,** cix, 746-7. **Thienemann, A.**—Pelopia und Tanypus. Bemerkungen zur nomenklatur der Meigen'schen Chironomidengattungen. (Arc. f. Hydrobiol. u. Plankt., Stuttgart, Suppl. Bd., ii, 555-65.)

**Aldrich, J. M.**—A new genus of two-winged fly with mandible like labella. **10,** xxiv, 145-8. **Curran, C. H.**—New and little known Canadian Syrphidae. **4,** liv, 94-6. **Johnson, C. W.**—New genera and species of Diptera. (Oc. Pap. Boston Soc. N. H., v, 21-6.) **Van Duzee, M. C.**—Three new species of Parasynthormon with a table of species (Dolichopodidae). **4,** liv, 88-90.

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lviii, 162. **Weiss, H. B.**—Notes on the puffball beetle, Caenocara oculata. **5,** xxix, 92-4.

**Knull, J. N.**—Annotated list of the Buprestidae of Pennsylvania. **4,** liv, 79-86. **Weise, J.**—Ueber einige amerikanische und austr lische nach Sudfrankreich eingefuhrte Coccinelliden. **48,** xxxix, 104.

**HYMENOPTERA. Brethes, J.**—Himenopteros y Dipteros de varias procedencias. **106,** xciii, 119-46. **Champlain, A. B.**—Records of hymenopterous parasites in Pennsylvania. **5,** xxix, 95-100. **Davis & Bequaert**—An annotated list of the ants of Staten Island and Long Island, N. Y. **19,** xvii, 1-25. **Donisthorpe, H.**—The colony founding of Acanthomyops (Dendrolasius) fuliginosus. **100,** xlii, 173-84. **Emery, C.**—L'ouverture cloacale des formicinae ouvrieres et femelles. **34,** iv, 62-5. **Herbst, P.**—Zur biologie der gattung Chilicola. **49,** xi, 63-8. **Mann, W. H.**—Ants from Honduras and Guatemala. **50,** lxi, Art. 13. **Mercet, R. G.**—El genero Azotus (Calcidos). (Bol. R. Soc. Espanola de Hist. Nat., Madrid, xxii, 196-200.) **Plath, O. E.**—Notes on Psithyrus, with records of two new American hosts. **100,** xliii, 23-44. **Smith, E. J.**—The rediscovery of Odynerus (Ancistocerus) waldenii. **4,** liv, 87. **Szepligeti, V.**—Ichneumoniden aus der sammlung des Ungarischen Nat. Museum. **103,** xii (1914), 414-32. **Turner, C. H.**—A week with a mining eumenid: an ecological behavior study of the nesting habits of Odynerus dorsalis. **100,** xlii, 153-72. **Wheeler, W. M.**—Observations on Gigantiops destructor, and other leaping ants. **100,** xlii, 185-201.

**Brues, C. T.**—On the hymenopterous genus Harpagocryptus and its allies. **5,** xxix, 101-9. **Mocsary, A.**—Chrysididae plerumque exoticae novae. **109,** xii (1914), 1-72. **Weld, C. J.**—Studies on chalcid-flies of the subfamily Leucospidinae, with descriptions of n. sps. **50,** lxi, Art. 6. **Weld, L. H.**—Notes on American gall-flies of the family Cynipidae producing galls on acorns, with descriptions of n. sps. Notes on cynipid wasps, with descriptions of new N. American sps. **50,** lxi, Art. 18 and Art. 19.

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ÉTUDES DE LÉPIDOPTÉROLOGIE COMPARÉE. By CHARLES OBERTHÜR. Volume XIX. part 2. Rennes, France, May, 1922. This volume contains an introduction by Mr. Oberthür and the following papers: A Contribution to the Study of the Aegeriidae, with descriptions of new species and varieties, by F. Le Cerf. The editor makes some interesting remarks on the species of *Parnassius* in Central Asia, which are followed by an article by André Avinoff on *Parnassius adestis* Gr. M. Oberthür presents an article on *Syrichtus alveus*. These difficult Hesperidae are receiving much study in Europe. Additional notes are given on the Lepidoptera of Morocco. Some of the interesting Lepidoptera of Madagascar receive consideration by the editor, the beautiful *Urania*

*ripheus* being particularly mentioned. Prof. C. Houlbert makes a valuable contribution, a study of the Melanargiinae of China and Siberia. There are 28 plates with the numerous species figured in color. These plates are of the superb character of those we have mentioned as appearing in former volumes. M. Oberthür richly deserves the thanks of all Lepidopterists for the production of this valuable series.—H. SKINNER.

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PROFESSOR BENEDICT JAEGER, Early Entomologist of New Jersey.—Under this title, Mr. Harry B. Weiss has contributed a biographical sketch to the *Proceedings of the New Jersey Historical Society* (new series, vol. VII, No. 3, pp. 196-207, Newark, N. J., July, 1922). The author tells us that his interest in Jaeger "was first aroused by reading in Mr. John D. Sherman's 'Catalogue 10 of Books on Insects' the following statement referring to Prof. Jaeger's book on 'The Life of North American Insects': 'famous as the most worthless of all American Insect books'." In his usual painstaking way, Mr. Weiss brings together a number of scattered bits of published and unpublished information on his subject. Jaeger was born in Vienna, Austria, in 1789, came to the United States in 1831 and died in Brooklyn, August 17, 1869. His activities in natural history embraced other groups of animals in addition to insects and also plants.—P. P. CALVERT.

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NOMENCLATOR COLEOPTEROLOGICUS. Eine etymologische Erklärung sämtlicher Gattungs- und Artnamen der Käfer der deutschen Fauna sowie der angrenzenden Gebiete. Zweite Auflage In Verbindung mit Prof. Dr. R. SCHMIDT herausgegeben von SIGM. SCHENKLING. Jena Verlag von Gustav Fischer 1922. 8vo., pp. iv, 255. Price in paper binding 95 Marks, in cloth 125 Marks.—In 1894 Herr Schenkling published the first edition of this book, now long since out of print. In 1917, at the expense of the German Union of Teachers of Natural Science, he issued an "Explanation of the scientific names of beetles in Reitter's Fauna Germanica" (Lutz, Stuttgart, publisher). This new edition of the Nomenclator Coleopterologicus goes beyond the "Explanation" in that it gives not only the meanings (in German) of the generic and specific names, but also their roots, both Greek and Latin, the quantity of the syllables of the roots, and a detailed chapter (pp. 1-12) on entomological nomenclature, explanations of technical terms and translations of a number of Latin adjectives, adverbs, numerals and conjunctions "so that one not acquainted with the ancient languages can, with the use of this book, translate Latin diagnoses and descriptions without great difficulty"—that is, if he can read German. The author further tells us in his preface: "One will find also in this book the explanation of many geographical names which, since they are often not of classical origin, are sought in vain even in the larger classical dictionaries. I need only hint at the high value of translations

for retaining scientific names in one's memory, as these names express, in great measure certain peculiarities of the structure or habits."

On the philological side Herr Schenkling has had the assistance of Prof. Richard Schmidt, of the University of Münster in Westphalia.

The greater part of the book is divided into two sections, generic and subgeneric names (pp. 13-116) and "Species and their varieties; terminology" (pp. 117-249), the names in both sections being arranged alphabetically. The nature of the information given is well illustrated by examples from each part:

**Cárabus** L. V. καραβος (kárabos), Käfername bei den Griechen, auch Meerkrabbe. Unmöglich von κείνω (keino) abschneiden, wie Leunis will.—Vgl. Scarabaeus?

**nemorális, e,** in Hainen vorkommend.

**Bogemáni** (nicht Bogemanni), nach dem früheren schwedischen Hauptmann J. C. Bogeman.

As the subtitle of this Nomenclator indicates, the names included are limited to those of the beetle fauna of Germany and of the neighboring countries. With the increasing diffusion of European Coleoptera to other parts of the world, however, this work will be useful to extra-European entomologists—who read German.—P. P. CALVERT.

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UNIVERSITY OF IOWA STUDIES (NATURAL HISTORY), X, I. Iowa City, March 15, 1922.—This number contains reports on the Scutelleroidea [by Prof. DAYTON STONER] and the Orthoptera and Dermaptera [by Mr. A. N. CAUDELL] of the Barbados-Antigua Expedition of the University in 1918, and a report on Scutelleroidea of the Douglas Lake Region, Michigan, also by Prof. Stoner. The Barbados-Antigua collection of Scutelleroidea consisted of about 800 pinned specimens, representing 17 species on Antigua (taken between June 19 and July 19) and 9 of the 17 also on Barbados (taken between May 16 and June 11). "Of the 17 Antigua species, 14 occur also in the United States and 3 are strictly neotropical. . . . As a whole the pentatomid fauna of the two islands seems to be Central American and Mexican in its affinities rather than South American."

The Orthoptera and Dermaptera of the same islands consisted of 334 specimens comprising 31 species, but no general summary accompanies Mr. Caudell's Report.

The Scuttelleroidea of the Douglas Lake Region were collected in July and August, 1919 and 1920, within 15 miles from the Lake, and amount to 23 species, which may be compared with the West Indian figures given above. No species is common to both lists but three genera (*Mormidea, Euschistus* and *Podisus*) are. Prof. Stoner makes a brief comparison of the pentatomid faunae of Douglas Lake and of Lake Okoboji, Iowa, the latter of 29 species, 17 of which are also found at Douglas Lake.—P. P. CALVERT.

REPORT OF THE IMPERIAL ENTOMOLOGIST 1920-21. By T. BAINBRIGGE FLETCHER. Calcutta Superintendent Government Printing, India. 1921. (Reprinted from Scientific Reports, Agr. Res. Inst. Pusa, 1920-21, pp. 41-59, pls. iii-viii).—The principal work done on insect pests during the year mentioned was a continuation of the investigation of borers in sugar cane and other gramineous plants and, on the side of pathological entomology, on Tabanidae in connection with surra disease and on Culicidae. A Chalcidid of the genus *Phanarus*? heavily infests the eggs of several Tabanids but it has not shown polyembryony. Twenty-one students received training to varying extents in agricultural and sanitary entomology, lac- and sericulture. The collection at Pusa is now estimated to contain rather more than 7,000 named species of Indian insects. Among the specialists whose aid in making identification is acknowledged are Messrs. Rohwer and Morgan Hebard, Profs. Cockerell and Felt. The project for the preparation and publication of a catalogue of all described Indian insects has been approved by Government and considerable progress made during the year. A notice of the first part of this catalogue (on Acrydidae or Tettigidae) appeared in the NEWS for March last, p. 95 of this volume.—P. P. CALVERT.

## OBITUARY.

WILLIAM LUCAS DISTANT, known especially for his work on Lepidoptera and Hemiptera, died at Wanstead, Essex, England, February 4, 1922. He was born at Rotherhithe, November 12, 1845, son of Capt. Alexander Distant, "who in old South Sea whaling-days, sailed round and round the world, and transmitted a love of roaming to his sons," and whom the son accompanied to the Malay peninsula in 1867. In his earlier years he was engaged in the tanning business and in this connection spent a year in the Transvaal in 1890-91, and made a second visit thereto in 1898. From April, 1899, to November, 1920, he was a part-time Assistant in the British Museum (Natural History), rearranging the national collection of Hemiptera and describing many new species. His own collection of about 50,000 specimens, chiefly in this order, and over 2500 types came to the Museum in 1911. The last decade of his life was saddened by the loss of his wife and two younger sons and by incurable and protracted disease.

American entomologists are especially interested in *Hemiptera Heteroptera*, Vol. I (1880-1893) and *Heteroptera Homop-*

*tera,* Vol. I in part (1881-1905), which he contributed to the *Biologia Centrali-Americana.* Among his other works are *Rhopalocera Malayana* (1882-1886), *Monograph of the Oriental Cicadidae* (1889-1892), *A Naturalist in the Transvaal* (1892), *Insecta Transvaaliensia* (1900-1911), *Rhynchota,* 7 vols. (1902-1918), in the *Fauna of British India, A Synonymic Catalogue of Homoptera, Part I—Cicadidae* (1906), as well as numerous shorter articles in the English journals from 1874 to 1920. He was editor of *The Zoologist* from 1897 to 1914, and a member of the Entomological Societies of London, France, Stockholm and Belgium and a corresponding member of the Buffalo Society of Natural Sciences. Appreciative notices of him appeared in the March numbers of *The Entomologist* and *The Entomologists' Monthly Magazine,* from which the above account is drawn.

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GEORGE ALEXANDER JAMES ROTHNEY, born in 1849, died January 31, 1922, formed an extensive collection of Oriental Hymenoptera, many of them collected by himself in India from 1872 on. This, together with a library on the same group, he presented during his life time to the Hope Museum at Oxford, England. (Ent. Mo. Mag., May, 1922.)

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Another martyr to research on the nature and transmission of typhus has fallen in the person of ARTHUR W. BACOT, who died in Cairo, Egypt, April 12, 1922. At the invitation of the Egyptian Government he had undertaken experiments with lice in the laboratories of the Public Health Department and it is supposed that he became infected by some accident. He was previously well known for his work on the bionomics of rat fleas (done at his home in Essex, England), of the Yellow Fever Mosquito (which he studied in Sierra Leone in 1914-15), and of lice in connection with trench fever (1915-17). In 1911 he was appointed Entomologist to the Lister Institute of Preventive Medicine, in 1916 Honorary Entomological Adviser to the War Office, in 1917 to the British Trench Fever Committee of the War Office, and in 1920 he went to Poland with the Typhus Research Commission of the League of the Red Cross

Society. His earliest entomological work was with the British Lepidoptera, elucidating many life histories and furnishing many data for genetics. (The Entom., June, 1922.)

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HENRY ROWLAND-BROWN, "one of the best known and most popular of British entomologists," died May 3, 1922, at Harrow Weald. He was born at Woodridings, Pinner, May 19, 1865, educated at Rugby and Oxford, was athlete, journalist and poet, active and efficient secretary of the Entomological Society of London, and made the diurnal Lepidoptera of France his special study. A number of his papers are included in M. Charles Oberthür's publications. Americans in attendance at the Second International Congress of Entomology, at Oxford, in 1912, will not fail to remember him and to regret his decease at a comparatively early age. He bequeathed his books to the London society and the Hope Museum, Oxford, his collection to the latter. An obituary notice is in *The Entomologist* for June, 1922.

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The same number reports the death of the well-known collector and author of "a very large proportion of the Rhopalocera section of Seitz's Exotic Macrolepidoptera," HANS FRÜHSTORFER, at Munich, April 9, 1922, in his fifty-ninth year.

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DR. OTTO TASCHENBERG. Professor of Zoology at the University of Halle, author of the unfinished *Bibliotheca Zoologica II*, died March 20, 1922, in his sixty-eighth year. (Wiener Ent. Zeit., xxxix, p. 112.)

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The death of LOUIS BEDEL, Coleopterist, was announced, without date, at the meeting of the Entomological Society of France, held February 8, 1922. His principal works were a *Monographie des Erotyliens* (1870), *Catalogue Raisonné des Coléoptères du Nord de l'Afrique* and *Faune des Coléoptères du Bassin de la Seine*, the latter two unfinished. He bequeathed the first set of his collection to the Entomological Laboratory of the National Museum of Natural History (Paris), the duplicates, his working instruments and such of his books not already in the Society's library to the Entomological Society of France. (Bull. Soc. Ent. France, 1922, nos. 3, 4.)

# EXCHANGES

**This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.**

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

**Halticini** wanted in exchange for Coleoptera or insects of other orders.—L. G. Gentner, 213 Bailey St., East Lansing, Mich.

**For Exchange**—A large number of the living pupae of European Sphingidae for the living pupae of American butterflies and moths. I. C. Cheesman, Curator of Insects, Zoological Society of London, Regents Park, London, N. W., England.

**Wanted**—Species of Homoptera, Hemiptera and Orthoptera not represented in my collection in exchange for duplicate material of these orders from South Dakota. List of duplicates on application. H. C. Severin, South Dakota State College, Brookings, South Dakota.

**Buprestidae, Cleridae,** and **Carabinae** wanted from U. S. or Buprestidae of the world. Will collect insects of any group (except Lepidoptera) in exchange or pay cash. Alan S. Nicolay, 416a Grand Ave., Brooklyn, New York.

**For Exchange**—A large number of live cocoons of Callosamia promethea, C. cynthia and P. cecropia for other pupae or Lepidoptera. D. C. Heim, Sunbury, Pa.

**Wanted to Exchange**—N. A. Coleoptera for same not in my collection. Carl Selinger, 4419 Dover St., Chicago, Ill.

**Wanted for Cash or Exchange**—Catocala eggs, also brilliant colored butterflies and moths for trays. Mrs. Robert Milde, Lewiston, Minn.

**Syrphidae** from all parts of North America wanted. Monographing the family.—C. H. Curran, Department of Entomology, University of Kansas, Lawrence, Kansas.

**Will collect** in all orders except Lepidoptera, in exchange for Cerambycidae (longicorn beetles) and Pentatomidae (stink-bugs). G. Chagnon, P. O. Box 521, Montreal, Canada.

**I will** collect Coleoptera and Lepidoptera in southwest Arkansas for those so interested.—Miss Louise Knobel, 417 West 2nd Avenue, Hope, Arkansas.

**Correspondence** solicited from anyone desiring general collections of insects, to be made in Costa Rica. Austin Smith, Apartado 412, San José, Costa Rica.

**Wanted**—For cash, during winter of 1922 and 1923, pupae of Saturniid moths. Please state species, quantity and price. P. Rau, 2819 S. Kingshighway, St. Louis.


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